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# COVID-19 vaccines fail to alter neuro symptoms of Long COVID

While vaccination decreases the severity of acute COVID-19 and the rate of hospitalisation and death, it does not alter the subsequent neurologic manifestations of Long COVID

R. Prasad

**W**hile COVID-19 vaccination decreases the severity of COVID-19 disease and the rate of hospitalisation and death, a study published recently has found that vaccination prior to SARS-CoV-2 infection does not necessarily reduce the neurological manifestations and burden of Long COVID. This includes patients who had a severe infection that necessitated hospitalisation and those with a mild infection who did not require hospitalisation. Common neurological symptoms of Long COVID include brain fog, numbness and tingling, headache, dizziness, problems with smell and taste, and intense fatigue.

At the beginning of the study, the authors hypothesised that since COVID-19 vaccines reduce the severity of COVID-19 disease, the vaccines may also similarly reduce the neurological manifestations of subsequent Long COVID. But the findings of the study have thrown a surprise. "While vaccination decreases the severity of acute COVID-19 and the rate of hospitalisation and death, the sobering conclusion of our study is that vaccination prior to infection did not alter the subsequent neurologic manifestations of Long COVID in our clinic population," the authors write. The study was published in the journal *Brain Communications*.

"We aimed to identify what effects – if any – vaccination prior to infection has on neurological symptoms of Long COVID, as

## Limitations of COVID-19 vaccines

The first **1,300 patients** with neurological symptoms of Long COVID were recruited for the study

It had two groups – **200** participants who were previously hospitalised for severe COVID-19, and **1,100** participants with only mild disease

Neurological symptoms of Long COVID occurred immaterial of whether the infection occurred before or after vaccination

People in both groups had impaired quality-of-life in cognitive, fatigue, sleep, anxiety and depression

Participants performed worse on a range of cognitive tests compared to the general population with no difference based on their vaccination status at the time of infection

Participants with breakthrough infections had more frequent pre-existing depression/anxiety than pre-vaccination infection groups

**10 months** after symptoms onset, brain fog, numbness/tingling, and headache were the most common neurological symptoms in people with severe disease

The three most common neurological symptoms in people with mild disease were brain fog, headache, and dizziness

well as the quality of life and cognitive function of our patients. These findings are sobering since it shows that vaccination prior to infection does not reduce the neurological manifestations of Long COVID," Igor Koralnik from Northwestern Medicine and the corresponding author of the paper said in a release.

The study recruited the first 1,300 patients with neurological symptoms of Long COVID at the Northwestern Medicine Neuro COVID-19 Clinic between May 2020 and March 2023. Of the 1,300 participants enrolled in the study, 200 participants had been previously hospitalised for severe COVID-19, while the remaining 1,100 participants had only mild COVID-19 symptoms that did require hospitalisation.

Besides grouping the patients based on the severity of the disease requiring hospitalisation, the authors also looked at the timing of infection – break-

through infection post-vaccination and infection prior to vaccination. Based on the quantitative metrics used to assess the quality of life, the study found that patients in both groups – those with severe disease requiring hospitalisation and those with a mild disease not requiring hospitalisation – had impaired quality-of-life in cognitive, fatigue, sleep, anxiety and depression immaterial of whether the infection had occurred post-vaccination (breakthrough infection) or before vaccination.

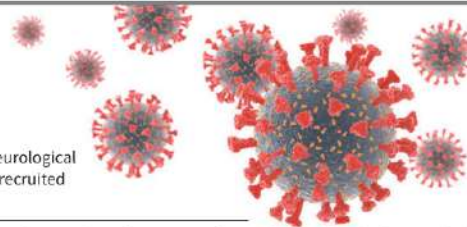
The study found that patients in both groups – severe disease requiring hospitalisation and mild disease not requiring hospitalisation – with breakthrough infections had more frequent pre-existing depression/anxiety than their respective pre-vaccination infection groups. Also, patients with mild disease not requiring hospitalisation due to breakthrough infections

had more frequent comorbidities of headache, lung and gastrointestinal diseases than those with infection before vaccination. An average of 10 months after symptom onset, brain fog (86.5%), numbness/tingling (56.5%), and headache (56.5%) were the three most common neurological symptoms in patients with severe disease requiring hospitalisation. For patients with mild disease not requiring hospitalisation, the three most common neurological symptoms were brain fog (83.9%), headache (70.9%) and dizziness (53.8%). Patients with mild disease caused by breakthrough infections more frequently reported dizziness (61.5%) compared to pre-vaccination infection patients (50.6%).

The study found that patients developing neurological symptoms of Long COVID after breakthrough infections have a higher burden of comorbidities than those with pre-vacci-

nation infections. According to the authors, this highlights different risk factors warranting targeted management. Further longitudinal studies are warranted to determine the long-term outcome of neurological symptoms of Long COVID patients with breakthrough infections and pre-vaccination infections, they note.

In another paper published in November 2024, the same team from Northwestern Medicine found that neurological manifestations of Long COVID disproportionately affected young and middle-aged adults regardless of acute COVID-19 severity. The study found that younger and middle-aged individuals accounted for 142 of 200 (71%) patients who were previously hospitalised for severe COVID-19 and 995 of 1100 (90.5%) patients with only mild COVID-19 symptoms that did require hospitalisation. While there was a higher prevalence of comorbidities and abnormal neurologic findings in older patients, at 10 months from COVID-19 onset, there was significant lower prevalence of neurologic manifestations of Long COVID in older patients. On the other hand, younger and middle-age patients suffer from a higher burden of neurological symptoms of Long Covid and cognitive dysfunction contributing to decreased quality of life. "Neuro Long COVID principally affects adults in their prime, contributing to profound public health and socioeconomic impacts warranting dedicated resources for prevention, diagnosis and interventions," they write.



# A confluence of faith and culture

## Maha Kumbh

The 45-day gathering of Hindu ascetics, saints, ash-smeared Naga Sadhus, skeleton-donning Aghoris and other pilgrims is expected to have a footfall of 450 million this year, nearly twice the population of Uttar Pradesh, India's most populous State

Ishita Mishra

**M**onday, January 13, marked the first day of 45-day long Maha Kumbh in Prayagraj, listed by UNESCO as the largest peaceful religious congregation of pilgrims on earth, where devotees walk miles to take a dip at 'Sanganj', the convergence of the holy rivers Ganga and Yamuna and the mythical Saraswati. The fair is visited by Hindu ascetics, saints, ash-smeared Naga Sadhus, skeleton-donning Aghoris and other pilgrims. It is expected to have a footfall of 450 million this year, nearly twice the population of Uttar Pradesh, India's most populous State.

Kumbh, derived from a Sanskrit word which means a pitcher, is rotationally held every three years at the four riverside cities of Prayagraj, Haridwar, Ujjain and Nashik. Its schedule is based on the planetary alignments, mainly of that of Sun and Jupiter. The Ardh (half) Kumbh is held every six years at Haridwar and Prayagraj while the Purna (complete) Kumbh takes place in all four cities, every 12 years. The Maha Kumbh happens after 12 Purna Kumbhs in Prayagraj, once in 144 years and is considered the most auspicious.

The mythological beliefs say that drops of *Amrit* (essence of immortality) were spilled at these sites from an urn which came out during the *Samudra Manthan* (churning of the ocean) done by the gods and demons.

The central ritual of the fair remains bathing in icy cold waters of the sacred rivers where millions immerse themselves with the belief that the act will cleanse them of their sins and liberate them from the cycle of birth and death and will attain spiritual liberation.

### A gathering of ascetics

Religious texts also link Kumbh Mela's origins to the 8th-century philosopher, Adi Shankaracharya, who established this practice of gatherings of ascetics from across the country, for discussion on religion. It was Shankaracharya who instituted the monastery system and the 13 Akharas (warrior-saint



PHOTO: PTI

sects) - Nirvani, Atal, Niranjani, Anand, Juna, Awahan and Agni, Nirmohi, Digambar Ani and Nirvani Ani, the two Udasini Akharas (Naya and Bachal) and the Nirmala Akhara. The saints from these sects, who sport weapons such as tridents, swords, and lances, are the main attraction at the Kumbh.

The latest in the line of Akharas is the Kinnar (transgender) Akhara, established in 2015 by transgender rights activist Laxmi Narayan Tripathi. The Akhara is still competing for space between the community of religious leaders but remains one of the most visited Akharas in Kumbh.

The Akharas use the fair as an opportunity to elect their chiefs and divide powers at its council meeting called the Dharam Sansad. This year, the meeting, scheduled for January 27, may pass a proposal for the formation of a 'Sanatan Board' (a board

dedicated to safeguard the Hindu religious sites), which will be sent to the government with a request for implementation.

The sects have already placed wishes such as no entry for Muslims and non-Hindus at the Kumbh, which was partially supported by Chief Minister Yogi Adityanath who says that those who don't believe in Sanatan Dharma should not visit the event.

Mahatma Gandhi had visited the Kumbh Mela in 1918. Political parties today capitalise on this event to win over Hindus. The fair was also used by the Vishwa Hindu Parishad to chalk out the blueprint for the Ram temple construction in Ayodhya in 1989.

With the BJP being in power at the Centre and State, this year's Kumbh is one of the most well-funded religious gatherings being held in the country. Prime Minister Narendra Modi dubbed it as 'A Maha Yuga of Unity', as the

Centre approved a special grant of ₹2,100 crore for it. About ₹7,500 crore was devoted to ensure proper logistics to host millions.

A sprawling tent city has been carved out within the limits of Prayagraj district, spread across an approximately 4,000-hectare area and divided in 25 sectors, 12 ghats for bathing. A large group of bureaucrats were deployed at the site to ensure smooth management of the fair. The airport was expanded to accommodate more flights while the Indian Railways has announced that it will run 13,000 trains to Prayagraj to ensure maximum devotees arrive at the Kumbh putting immense pressure on the town which exceeds its carrying capacity every time the fair is organised. In the 2019 Kumbh, this gathering generated 18,000 metric tonnes of solid waste.

Approximately 1,60,000 tent shelters have been constructed this

time to accommodate 15-20 lakh *Kalpuzais* - devotees who spend around a month in the fair living a minimalistic life. Although the tents are free for the *Kalpuzais*, they do bear the brunt of rocketing price of groceries, travel and other needs.

Apart from the cubical-shaped hiking tents for *Kalpuzais*, the government has also set aside luxury cottages across the Sangam bank to drive tourism. These cottages cost ₹50,000 to ₹1 lakh per night.

With 1,50,000 toilets, deployment of police officers, hospitals, banks, and eateries, the State has not left any stone unturned to make the Maha Kumbh an event like never before.

The fair has gigantic posters of the Prime Minister and the Chief Minister, advertising schemes and achievements of the BJP government, including the LPG schemes, Swachh Bharat, solar energy, among others.

### Business opportunities

The fair presents business opportunities to both local traders as well as multinationals who set up kiosks to expand businesses. From Domino's pizza to Cafe Coffee Day, from BBL to LIC and from medicines to clothes, agriculture products and gadgets, the Maha Kumbh has a stall selling everything. The State has projected to generate up to ₹2 lakh crore from this 45-day long gathering, which will end on February 26.

With millions gathering at the river banks, the Kumbh Mela has seen accidents such as stampedes in the past, which led to the deaths of hundreds of pilgrims. With the humongous footfall at the site, incidents of missing cases too have become synonymous with the fair. Several Bollywood movies have drawn their plots from the Kumbh where heroes get separated from families at the fair and then dramatically reunited decades later.

After the end of the gathering, Sangam city will once again turn into a barren land, which will be used by the farmers to grow melons and children to play, leaving the sand banks to wait for another Kumbh to feel lively again.

### THE GIST

▼ Kumbh, derived from a Sanskrit word which means a pitcher, is rotationally held every three years at the four riverside cities of Prayagraj, Haridwar, Ujjain and Nashik

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▼ The Maha Kumbh happens after 12 Purna Kumbhs in Prayagraj, once in 144 years and is considered the most auspicious



# Can Bhopal waste be safely disposed of?

What is the plan on the hazardous gas leak waste? How much has the Central government allocated to the Madhya Pradesh government to incinerate the waste and deposit the residue at a landfill in Pithampur? Why have there been protests?

**Priyali Prakash**  
**Vasudevan Mukunth**

## The story so far:

**I**n January 2, Madhya Pradesh government authorities moved 358 tonnes of hazardous waste from the defunct Union Carbide facility in Bhopal to the Pithampur industrial area in Dhar district. On December 3 last year, the Madhya Pradesh High Court had set a four-week deadline for authorities to dispose of this waste, nearly 40 years after the gas disaster that killed more than 4,000 people and injured or debilitated thousands more.

## What is the waste's status?

The disaster on the intervening night of December 2-3, 1984, was the result of poisonous gases leaking from the plant, which Union Carbide had set up to manufacture fertilizers. The waste at the facility is composed of the ingredients required to make these fertilizers.

After years of lying in Bhopal and multiple petitions from civil society groups, the Madhya Pradesh government was to incinerate the waste at a Treatment, Storage, and Disposal Facility (TSDF) in Pithampur more than 200 km away. Officials arranged for the waste to be packaged

The U.S. Environmental Protection Agency says composite liners at landfills with hazardous waste will degrade and have to be reinstalled at intervals

and transported in secure long-haul containers. But protests in the industrial town by the local population fearing harmful emissions from the incineration have paused the State's plans.

On January 6, the Madhya Pradesh High Court gave the State government six weeks to safely dispose of the waste. The order came after State authorities had also sought time to spread awareness about the manner of disposal and measures to minimise its effects on health and the environment.

The Central government has allocated ₹126 crore to the State to incinerate the waste and deposit the residue in the TSDF landfill.

## Why Pithampur?

In 2012, the Supreme Court selected the Pithampur facility as being the most suitable final destination for the waste. According to the Central Pollution Control Board (CPCB), it is the sole TSDF in the State and includes a landfill and an incinerator. The CPCB submitted an affidavit to the apex court in 2013 attesting to the TSDF's ability to 'handle' the waste.

In 2015, Madhya Pradesh organised a 'trial run' in which it incinerated 10.1 tonnes of the waste at the TSDF. The CPCB monitored the process with help from experts from private laboratories in Chennai and Hyderabad. Notably, the State had secretly advanced the incineration date by a few days to sidestep local resistance.

According to Bhopal Gas Tragedy Relief and Rehabilitation Department director Swatantra Kumar Singh, the emissions from the trial were under stipulated limits. The State's public relations office also reported no adverse effects on the environment or on public health.

## Is the waste harmful?

The 'trial' waste consisted of 4.8 tonnes of excavated waste, 1.6 tonnes of semi-processed residue, 1.3 tonnes of naphthol waste, 1.3 tonnes of carbaryl residue, and 0.8 tonnes of reactor residue. According to a December 2024 press release from the State's public relations office, the Regional Director (Central) of CPCB Bhopal had collected and tested five water samples from around the Pithampur TSDF. The report

(numbered WW24.25-188.189) indicated the water colour, chloride, sulphate, and fluoride concentrations, hardness, and the amount of total dissolved solids "exceeded permissible limits" specified in the IS 10500 standard in two open wells near the landfill.

However, the release said according to "scientists involved in the analysis" the higher values "reflect groundwater quality and don't appear to be linked to the TSDF operations".

The release also said experts from the All India Institute of Medical Sciences (AIIMS) Bhopal and the Indian Council of Medical Research reportedly surveyed 12 villages and found the prevalence of skin and respiratory ailments to be lower than the national average.

Credible media reports in 2015 had said around four-times as much ash and residue as the waste combusted (by mass) had been generated and which the CPCB had said it would dispose of in the landfill, including protections to contain leachates.

The U.S. Environmental Protection Agency (EPA) has said these protections can degrade and need to be reinstalled at periodic intervals.

## What next?

Madhya Pradesh has temporarily put off incinerating the waste. Authorities have said the local protests, including two attempts at self-immolation, mean they would first like to improve public confidence in the safety of the disposal process.

"We are preparing 50-odd master trainers, including science teachers, professors, and officials," *PTI* quoted Dhar collector Priyank Mishra as saying. "They will be informed about the exact status of the waste before they reach out to people to dispel misinformation."

There will also be another trial run: a 90-kg batch will be incinerated at 1,200° C, Mr. Singh said. According to the EPA, most organic compounds (like naphthol) are destroyed when subjected to 590° to 650° C. Operating hazardous waste incinerators at 980-1,200° C would thus strip the waste of organics.

If the resulting emissions don't breach legal thresholds, the rest will be incinerated in batches of 270 kg each over three months. If the emissions exceed, Mr. Singh had told *The Hindu* the batch size would be reduced and the duration extended to nine months.

The next hearing in the High Court is set for February 18.

*With inputs from Mehul Malpani.*



**Sensitive issue:** Trucks with toxic waste inside Pithampur Industrial Waste Management Pvt Ltd in Dhar, Madhya Pradesh on January 11. A.M. FARUQUI



# Why are fertility levels declining in India?

What has a global study shown about the total fertility rate in India? Why are the southern States worried?

C. Maya

The story so far:

A comprehensive demographic analysis of global fertility in 204 countries and territories from 1980-2021 has found that fertility is declining globally and that future fertility rates will continue to decline worldwide, remaining low even under successful implementations of pro-natal policies.

**What has it noted about India?**

The Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2021, noted that India has moved from a fertility rate of 6.88 in the 1990s to a Total Fertility Rate (TFR) of 1.9 in 2021. This, it pointed out, was below the replacement fertility level of 2.1 (which is the average number of children a woman should have to replace herself and her generation, for population stability). The GBD study projected that the TFR could fall further to 1.04 – barely one child per woman – by 2050.

The steep fall in fertility levels has triggered concerns about the political and socio-economic fallout, especially in the southern States, which fear the loss of parliamentary seats post the delimitation exercise in 2026.

**Why is fertility falling?**

Even though the country has had one of the oldest birth control/family planning programmes, increased female literacy, workforce participation of women, women's empowerment and improved aspirations could have contributed more to the steady drop in fertility rates over the decades than the faithful adoption of family planning initiatives.

With an ageing population, increased demands on healthcare, a migrating youth, the consequences of declining fertility are being acutely felt in States such as Kerala. The decline in fertility rate has also a lot to do with changing societal attitudes towards marriage and reproduction, with women increasingly exercising their choice. They often prefer to marry late or not at all, often choosing career and financial independence over motherhood. Rising rates of infertility in both men and women and abortions are important factors which could be contributing to this decline in fertility though no absolute data is available. With an increasing number of young men and women opting to go abroad for higher studies and jobs and choosing to settle down and raise their families there, migration is another key factor that could be in play when one considers the decline in fertility levels.

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**What are the implications?**

Declining fertility rates have resulted in a rapid demographic transition in many southern States. The consequences of this – an ageing population, a declining young workforce and increased demands on healthcare and social security measures for the care of an increasing population of the elderly – are being acutely felt in States such as Kerala. Migration of youngsters in search of better prospects is also an issue.

**What is happening in the southern States?**

There is concern over the irreversible fertility decline across the country, but more so in the southern States, where fertility rates had dropped below the replacement levels much earlier than the rest of India.

Kerala led the demographic transition in the South, achieving the replacement level fertility rate in 1988, with the other four States achieving this by mid-2000, along with education and women's empowerment and development in the social and health sectors, which were the hallmark of Kerala's high human development index, the State has also seen low economic investments and growth. Educated youth are leaving the State; the proportion of the aged population is expected to surpass that of children (23% in 2036). Changed attitudes towards marriage and motherhood are beginning to reflect in the health of women, leading to an increasing proportion of older mothers and pregnancy-related morbidities.

Kerala's high labour wages and high quality of life index are attracting internal migration from other States to supplant a shrinking workforce. The State Planning Board reckons that by 2030, the proportion of migrant labour could be close to 60 lakh, about one-sixth of the State's population.

**What is the way forward?**

Fertility decline is almost always irreversible and the graph, once it starts going down, may never bounce back. Countries like South Korea, which tried to stem the demographic crisis by pumping in millions have failed and the fertility rate plunged from 1.78 in 2022 to 0.73 in 2023.

Demographers suggest that socio-economic policies that propel the growth of the economy, improve job prospects for the youth and tap the potential of a growing population of senior citizens, can help in reducing the impact of a long spell of low, sub-replacement level fertility rates on countries.



# Will the ceasefire in the Gaza Strip hold?

How did Israel and Hamas come to an agreement? Why did it take 15 months for a deal? What will it entail? What role did Qatar, Egypt and the U.S. play? How will it affect other countries in the region? How will things change with Trump in the White House?

Stanly Johny

## The story so far:

**A**fter 15 months of fighting, which was triggered by Hamas's October 7, 2023 attack in which about 1,200 people were killed, Israel and Hamas have accepted a ceasefire in Gaza. On Saturday, Israel's 24-member cabinet gave approval to the agreement, which is expected to be implemented in three phases. The deal, which came into force on Sunday, was reached in talks mediated by Qatar, Egypt and the U.S. If it holds, it would provide a desperately needed relief for Gaza, the tiny strip along the Mediterranean Sea which was relentlessly bombed by Israeli Defence Forces (IDF) over the past 15 months in which over 46,000 Palestinians were killed and almost the entire population of the enclave displaced.

## What are the terms?

The deal is to be implemented in three phases. In the 42-day first phase, Hamas will release 33 hostages, most of those alive, and Israel will free roughly 1,000 Palestinian security prisoners. Israel will also partially withdraw the IDF from Gaza, and allow the entry of about 600 trucks of humanitarian aid into the enclave every day. The IDF is expected to withdraw from the Netzarim Corridor, which separates northern Gaza, which has seen massive Israeli bombardment from Day one of the war, from the south, where most of the enclave's population have been pushed into. If the Israeli troops withdraw from Netzarim, it

Arab and Israeli media claim that the Trump factor played a key part

would allow some of the displaced Gazans to move from the south and centre to the north.

But in the first phase, Israeli troops will remain in the Philadelphi Corridor on the Rafah crossing – which means Israel will continue to monitor Gaza's border with Egypt. On the 16th day of the first phase, discussions are expected to begin on the second phase. If the first phase is implemented as per plan, 65 hostages will still be in Hamas's captivity and Israeli troops will still be there at Philadelphi and some buffer zones in Gaza. In the second stage, Hamas will be required to release most of the remaining living hostages and both sides should declare a permanent end to the hostilities. The third phase will involve discussions on the 'day after'.

## Why did both parties accept a ceasefire now?

The deal accepted by both parties is not essentially different from the deal offered eight months ago. Hamas had announced earlier that it would accept a deal, provided the war is brought to a permanent end.

In May, Israeli Prime Minister Benjamin Netanyahu dismissed the agreement, saying Israel would continue its military offensive in Gaza until it meets its objectives.

But a lot has changed in the region since. Israel now believes its regional standing has become stronger. Hezbollah, the Lebanese militia organisation, has lost most of its top leadership in Israeli attacks. The IDF has killed most of the leaders of Hamas, including Yahya Sinwar. Israel carried out a massive air strike in Iran in October, targeting the Islamic Republic's air defences and other military facilities (to which Iran hasn't responded yet). More importantly, the fall of the Assad regime in Syria has further weakened Iran's so-called 'axis of resistance' in West Asia. Mr. Assad's Syria was the land bridge between Iran and Hezbollah. Since this land bridge is disrupted, Hezbollah will find it difficult to rearm itself. These developments have also strengthened Mr. Netanyahu's political standing at home.

These factors probably influenced him to change his position about a deal with Hamas. But that's not all.

After months of fighting, Israel failed to meet its declared objectives in Gaza. When he launched the war, Mr. Netanyahu said Israel would dismantle Hamas. Israeli attacks have degraded Hamas's militant infrastructure, but Hamas reinvented itself as an insurgency, its original avatar. Antony Blinken, the U.S. Secretary of State, recently said the American assessment was that Hamas recruited as many fighters as it had lost.

The inability to meet its objectives through

military means might also have influenced Israel's leaders to take a more pragmatic view of pausing the conflict and getting the hostages freed. Then, there is the Trump factor.

## What role did the U.S. play?

The Biden administration has been pushing for a ceasefire for long, but it also offered full support to Israel's war in Gaza. Washington continues to supply weapons to Israel and offer diplomatic protection to Israel at global fora. Mr. Biden's refusal to use effective pressure tactics on Israel meant that the latter continued the war despite Washington's public call and private diplomatic push for a ceasefire. But now, Mr. Biden can claim that a ceasefire was reached just days before he left the White House. Arab and Israeli media claim that the Trump factor also played a key role. Donald Trump had earlier said that "all hell will break loose" if there was no agreement between Israel and Hamas before he takes office on January 20 as the 47th President of the U.S. Mr. Trump's West Asia envoy Steve Witkoff had met the negotiators and the Israeli leadership last week. *Times of Israel* reported, quoting Arab officials, that Mr. Witkoff managed to achieve in a single meeting more than what President Biden did the whole year.

Mr. Trump is known for his pro-Israel positions. But he had promised during his campaign that he would bring the wars in West Asia and Ukraine to an end if returned to the White House. If the war is brought to an end, besides the humanitarian angle, it would offer some stability to West Asia. Mr. Trump may not like the U.S. being drawn into another never-ending war in the region. Also, if the Israel-Hamas war pauses, the Houthis of Yemen could stop attacking Israel and the ships passing through the Red Sea. Both the U.S. and Israel carried out air strikes against the Houthis in recent months but failed to stop their attacks.

If the Red Sea calms down, normal freight traffic through the Suez Canal could resume, tamping down the inflationary pressure on the global economy.

## Why is Phase 3 going to be a challenge?

As of now, the focus of both parties would be on implementing the first phase – which has a fair chance of being implemented. The second phase could see the exchange of more hostages for prisoners. But the real challenge would be Phase 3. Hamas has demanded a complete withdrawal of Israeli troops from Gaza. Israel now realises that it cannot dismantle Hamas – the organisation would survive in one way or another. On a more practical note, Israel doesn't want to leave Hamas as a ruling or fighting force in Gaza. This poses a dilemma for Israel. If it agrees to end the war and leave Gaza, Hamas would remain a militant insurgency in Gaza. If Israel continues to stay in Gaza, there won't be a lasting ceasefire agreement and a war of attrition will go on.



**In ruins:** Smoke rises over the Gaza Strip after an Israeli strike, as seen from the Israeli border on January 17. GETTY IMAGES

# I am not entirely against Indianism, don't go correcting people: Tharoor

**Sanjana Ganesh**  
CHENNAI

"I don't go around correcting people's English as people famously think," said writer-politician Shashi Tharoor as he discussed etymology, Indianism, creative insults by writers, and his tryst with trolls, and memes with the Chief Executive Officer of The Hindu, L.V. Navaneeth, at the session titled "A wonderland of words", named after his book.

Mr. Tharoor had tied his tryst with words to his father Chandran, who often challenged him with word games. His father had back then created a nascent version of *The New York Times* word game Wordle.



Shashi Tharoor in conversation with L.V. Navaneeth. R. RAGU

"My father was a self-taught man from a village in Kerala where the standard of the [English] language was not too great. He read and subsequently fell in love [with English]. It is this love that is passed down to us. My father had

a great zeal for life. When I was young, I was happy to escape into a book and ignore the world. He shook me out of it," he said.

The author went on to speak about words that have made it to common Indian parlance including

'non-veg', 'wheatish complexion' and 'passed out'.

He said that Indians often made the mistake of using the word 'until' incorrectly.

He finally added that he was a proponent of the usage of the word 'prepone' as 'advance' seemed alien. "People are often surprised to know that I am not entirely against Indianism," he said.

He added that he invented the word 'Atmami' – a portmanteau of the Sanskrit 'Atma' meaning soul and the French 'Ami' meaning friend to mean soulmate or kindred spirit, at the Pune Literature Festival earlier, and hoped that the word could be used more often.



# In a first, doctors use tele-robotic system to do two heart surgeries, over a distance of 286 km

**Bindu Shajan Perappadan  
Jacob Koshy**  
NEW DELHI

Combining cutting-edge technology with medical innovation, doctors used India's first indigenous surgical tele-robotic system to successfully conduct two complex heart surgeries over a distance of 286 kilometres - the longest, physical separation so far achieved in India between a patient and the operating surgeon.

The surgical-robotic system, SSI Mantra, developed by the medical technology company, SSI Ltd, is the first-of-its-kind system in India. It conducted two surgeries on January 9 and 10 on two men, aged 59 and 56, with a team stationed at the SSI's robotics control in Gurugram and



Dr. Lalitaditya Malik and his team after the two successful heart surgeries. SPECIAL ARRANGEMENT

another at the Manipal Hospital in Jaipur.

The first procedure was an internal mammary artery harvesting, which involves removing the artery for a coronary artery bypass grafting. The second was a total endoscopic coronary artery bypass, which is considered a complex cardiac surgery as the

surgeon has to work on the artery while the heart is still beating.

Speaking to *The Hindu* about the surgeries, Dr. Lalitaditya Malik, cardiothoracic vascular surgery consultant at the Manipal Hospital in Jaipur, said his team of 10 medical staff and five from an Information Technology support

team did mock drills for these operations for nearly a week every day before the actual procedures.

## **Better precision**

"Latency time, ensuring good connectivity, anticipating and being prepared for medical and technical problems are the challenges associated with the procedure. The advantages include reduced time of operation, better precision, minimal operation trauma to the body in terms of incision, blood loss, recovery time and chances of infection," he said.

The surgeries were successful because the underlying technology enabled a latency of 35-40 milliseconds (one-20th of a second), meaning that actions executed in

Gurugram were almost instantaneously transmitted to the robotic surgical instruments in Jaipur. The patients have been discharged.

The surgeon involved, Sudhir Srivastava, founder of SS Innovations, and who specialises in robotic cardiac surgery, told *The Hindu* that MantraSync was a proprietary tele-surgical network module specifically designed to work seamlessly with the SSI Mantra surgical-robot system.

"The technology has been approved by the Central Drugs Standard Control Organisation in India under Class B and Class C surgical devices. These approvals affirm the safety, efficacy, and regulatory compliance of the system for use in hospitals across India," said Dr. Srivastava.





# Survey adds 24 new species to Munnar's faunal stock

**The Hindu Bureau**  
THIRUVANANTHAPURAM

A faunal survey in the Munnar Wildlife Division has led to the addition of 24 new species of birds, butterflies, and odonates to its checklist.

The exercise, undertaken by the Forest Department in association with the Travancore Nature History Society, simultaneously surveyed the Mathikettan Shola National Park (MSNP), Pambadum Shola National Park (PSNP), Anamudi Shola National Park (ANP), Kurinjimala Wildlife Sanctuary (KWLS), Eravikulam National Park (ENP), and Chinnar Wildlife Sanctuary (CWLS) from January 8 to 12. The area, lying between 500 and 2,800 metres in elevation, was surveyed by 21 teams comprising 78 delegates.

A total of 217 species of birds were documented during the survey, including 11 new species, thereby increasing the bird popula-



**New additions:** Anamalai Sholakili, Red-disc Bushbrown and Red-veined darter. SPECIAL ARRANGEMENT

tion in the Munnar Wildlife Division to 258. The additions include the Brown Hawk Owl, Barred Buttonquail, Spotted Owlet, Mottled Wood Owl, Baya Weaver, Red Munia (Red Avadavat), Richard's Pipit, Jerdon's Bushlark, Golden-Headed Cisticola, Large Grey Babbler, and Chestnut-Bellied Nuthatch.

Other notable species spotted included the Nilgiri Wood Pigeon, Mountain Imperial Pigeon, Great Eared Nightjar, Steppe Eagle, Bonelli's Eagle, Monta-

gu's Harrier, Eurasian Sparrow Hawk, Lesser Fish Eagle, Peregrine Falcon, Indian Eagle Owl, Spot-bellied Eagle Owl, Indian Grey Hornbill, and Blue-eared Kingfisher.

The MSNP recorded 84 species, PSNP recorded 72, ANP 53, KWLS 68, ENP 115, and CWLS 173 species.

**8 new butterfly species** Munnar continues to be home to several species of butterflies with 166 species recorded, including eight new records, bringing the

checklist to 246 species. The highest number of butterflies was recorded at Chinnar with 148 species, followed by Eravikulam (79 species), and Mathikettan Shola (57 species).

Endemic butterflies such as the Red-disc Bushbrown, Palni Bush-Brown, Palni Fritillary, Palni four-ring, Nilgiri four-ring, Nilgiri Clouded Yellow, and Nilgiri Tiger were observed. Grass Jewel, the smallest butterfly in the State, was abundant at Chinnar. The largest Indian butterfly, the

Southern Birdwing, was also recorded in most of the camps. As many as 33 species were observed, despite the cold weather prevailing in the region. With an addition of five new records, the total number of odonates in Munnar has increased to 58 species.

Five relatively common odonates of lower elevations, which were previously unrecorded, were also reported. These include *Cratilla lineata calverti* (Forster, 1903), *Macrodiplex cora* (Kaup in Brauer, 1867), *Palpopleura sexmaculata* (Fabricius, 1787), *Tholymis tillarga* (Fabricius, 1798), and *Lestes elatus* Hagen in Selys, 1862.

In addition to these, the researchers documented mammals such as the Nilgiri tahrs, tigers, leopards, Nilgiri martens, gaurs, elephants and 12 species of reptiles and amphibians. The survey was formally launched by Harikrishnan K.V., Wildlife Warden, Munnar Wildlife Division.

